

### REMARKS

The present remarks are responsive to the Office Action mailed on 08/09/05. Claims 1-4, 6-16 and 20-23 are pending in this application. Claims 5, and 17-19 have been cancelled by prior amendment. Claims 2, 3, 16, 20-21 and 23 have been provisionally canceled by the present amendment and claims 2-3 and 21 have been rewritten as shown by respective new claims 24, 25, and 26 to correct informalities. The drawings have been formalized as requested by the examiner and each sheet has been marked as Replacement Sheets. No new matter has been added.

Accompanying this communication is a petition to extend the prosecution on this matter for three months and the appropriate fee. By the foregoing amendments and the following remarks, Applicants respectfully submit that claims 1, 4, 6-15 and 22, 24-26 are now in condition for allowance and Applicants respectfully request allowance of such claims.

#### Discussion of the Office Action

In the Office Action of August 9, 2005 the Examiner objected to the drawings because they are informal. The Examiner also stated that claims 2, 3 and 20 are improper due to informalities based on dependency. The Examiner also rejected claims 1-3, 6-7, 9-13, 16, 20 and 23 under 35 U.S.C. §102(e) as being anticipated by Fukushima (U.S. Patent 5, 805, 759) and he rejected claims 4, 15, 8, 14, 21 and 22 under 35 U.S.C. §102(e) as being anticipated by (U.S. Patent 6, 226, 428) to Saito et al.

### Objection to the drawings

The objection to the drawings has been overcome by the amendment thereto.

### Objection to claims 2, 3 and 20 due to informalities

As set forth above, claims 2, 3 and 20 have been provisionally canceled by the present amendment and have been renumbered as claims 24, 25 and 26 respectively to correct informalities. In light of the amendments, the objections to claim 2, 3 and 20 have been rendered moot.

### Discussion of the rejection of claims 1-3, 6-7, 9-13, 16, 20 and 23 under 35 U.S.C. §102(e)

As set forth above, claims 1-3, 6-7, 9-13, 16, 20 and 23 stand rejected under 35 U.S.C. §102(e) as being anticipated by Fukushima (U.S. Patent 5, 805, 759). Applicants respectfully traverse the rejection.

Under MPEP 706.02(a), it is well established that for a reference to support a rejection under 35 USC §102, that **reference must teach each feature** recited in the claims so rejected.

Moreover, the federal circuit has stated that:

“Under 35 U.S.C. §102, anticipation requires that each and every element of the claimed invention be disclosed in the prior art.” *Akzo N.V. v.*

*United States Int’l Trade Comm’n*, 1 USPQ 2d 1241, 1245 (Fed. Cir. 1986)

Regarding independent claim 1, The Examiner stated that Fukushima “discloses a wavelength router, having: at least one diffraction grating (20) which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number, a second diffraction grating (22)

positioned to receive outputs from the first mentioned diffraction grating, a collection optic assembly (48) positioned to receive outputs from the first second diffraction grating, and a plurality of filter modules (6) positioned to receive outputs from the collection assembly.”

With respect to claim 1:

Previously amended independent claim 1 is as follows:

In a wavelength router for fiber optical networking and computer interconnects, the improvement comprising:

at least one diffraction grating which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number,

a second diffraction grating positioned to receive outputs from said first mentioned diffraction grating,

a collection optic assembly positioned to receive outputs from said second diffraction grating, and

**a plurality of filter modules positioned to receive outputs from said collection optic assembly.**

Applicants respectfully submit that Fukushima does not disclose nor suggest each feature of Applicants’ claim 1, as mandated under MPEP 706.02(a) and Azko; specifically the bolded limitation of the last element of Applicants’ claim 1, as shown above. Applicants submit that the **filter module (6)** of

Fukushima is positioned to receive outputs from the pair of gratings (i.e., 20 and 22 and denoted by reference numeral 2) **but is not configured** to receive outputs from the second pair of gratings (i.e., gratings 24 and 26 and denoted by the reference numeral 4, deemed the collection optic assembly by the Examiner). For example, in the sixth full paragraph of column 7, lines 43-65, Fukushima states in describing the cited figure by the Examiner, "Therefore, according to the above embodiments of the present invention, an apparatus (such as an optical equalizer) attenuates an input light. The apparatus includes first and second converters and an attenuator positioned between the first and second converters. **The first converter** (see, for example, beam expander 2 in FIG. 1) **converts the input light into a spectral beam propagating in a first direction** (see, for example, the X direction in FIG. 1) and having wavelength components spatially separated in a second direction (see, for example, the Y direction in FIG. 1) perpendicular to the first direction. **An attenuator** (see, for example, attenuator plate 6 in FIG. 1) **intersects the spectral beam** and has a planer distribution of transmittance so that the spectral beam passes through the attenuator and is attenuated in accordance with the planer distribution of transmittance. **The second converter** (see, for example, beam condenser 4 in FIG. 1) **converts the attenuated spectral beam into an output light**." As other examples, Figures 12-14 and the respective descriptions of Fukushima illustrate how the attenuation filters of Fukushima are positioned to receive an input spectrum and output an attenuated spectrum to be received by the second pair of gratings (i.e., the

collection optic assembly as stated by the Examiner). Conversely, Applicants disclose that the filter(s) utilized in the present invention is positioned to receive outputs from the collection optic assembly (See for example Fig. 3).

Accordingly, Applicants respectfully submit that the rejection under U.S.C. §102(b) of claim 1 and dependent claim 6, which depends from claim 1 and thus contains all of the limitations of such claim is improper and is requested to be removed.

Regarding claim 7, The Examiner stated that Fukushima “discloses a wavelength router, having: at least one diffraction grating (20) which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number, a second diffraction grating (22) positioned to receive outputs from the first mentioned diffraction grating, a collection optic assembly (48) positioned to receive outputs from the first second diffraction grating, and a plurality of filter modules (6) positioned to receive outputs from the collection assembly. See Fig. 12 of the reference along with its respective portion of the specification.”

Previously amended independent claim 7 is as follows:

In a wavelength router for fiber optical networking and computer interconnects, the improvement comprising:

at least one diffracting grating operated in a Littrow configuration which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number,

a collection optic assembly positioned to receive outputs from another diffraction grating, and

**a plurality of filter modules positioned to receive outputs from said collection optic assembly.**

Applicants respectfully submit that similar to the reasoning for the rejection of claim 1 under U.S.C. §102(e), Fukushima also **does not disclose nor suggest** each feature of Applicants' claim 7, specifically the bolded limitation of the last element of Applicants' claim 7, as shown above, i.e., a plurality of filter modules positioned to receive outputs from said collection optic assembly.

Claims **2-3** have been canceled and rewritten as new claims **24** and **25** respectively and claim **21** has been canceled and rewritten as new claim **26** to correct for informalities. Accordingly, the rejection of claims **2, 3** and **21** has been rendered moot.

Accordingly, in light of the discussion above regarding the rejection of claim 1 under U.S.C. §102(e), the rejection under U.S.C. §102(e) of claim 7, which has similar arguments and dependent claims **8-10**, and **24-26**, which directly or indirectly depend from claim 7 and thus contain all of the limitations of such claim, is also deemed improper and is requested to be removed.

Regarding independent claim **11**, The Examiner stated that Fukushima "discloses a wavelength router, having: at least one diffraction grating (20) which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number, a second diffraction (22) grating

positioned to receive outputs from the first mentioned diffraction grating, at least one collection and re-direction optic assembly (28) positioned to direct inputs to the first mentioned diffraction grating, and a retro-reflector assembly (124) positioned to receive outputs from the second diffraction grating and reflect certain of the outputs back through the diffraction grating. See Fig. 22 and Fig. 23, along with the respective portions of the specification.”

Currently amended independent claim 11 is as follows:

In a wavelength router for fiber optical networking and computer interconnects, the improvement comprising:

a first diffraction grating,

a second diffraction grating positioned to receive outputs from said first mentioned diffraction grating, wherein said first and said second grating operate so as to utilize only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number,

at least one collection and re-direction optic assembly positioned to direct inputs to said first-mentioned diffraction grating, and

a retro-reflector assembly positioned to receive outputs from said second diffraction grating so as to **retro-reflect solely predetermined complimentary outputs produced by said first and said second gratings for redirection by said at least one collection and re-direction optic assembly.**

Applicants respectfully submit that Fukushima does not disclose nor suggest each feature of Applicants’ amended claim 11, as shown above by the bolded portion of the last element of the claim. Applicants submit that

Fukushima does disclose a retro-reflector assembly (as shown in Figs. 22 and 23 and corresponding specification as cited by the examiner) but not for retro-reflecting **“solely predetermined complimentary outputs produced by said first and said second gratings for redirection by said at least one collection and re-direction optic assembly.”** Applicants conversely, disclose such an embodiment on page 9, first full paragraph of the specification wherein Applicants state, “As shown in Figure 2, inputs 1, 2, and 3 are incident onto gratings G1 and G2 producing outputs 1', 2', and 3' and **complimentary outputs 1\* and 2\***, as indicated by the arrows. **Outputs 1\* and 2\* are reflected by the RR** back through gratings G1 and G2 to the CRD, as shown by the double arrows, **and are redirected by the CRD**, as indicated at 11 and 12 onto gratings G1 and G2.

Accordingly, Applicants respectfully submit that because Fukushima does not disclose or teach each of claim **11**, the rejection under U.S.C. §102(e) of amended independent claim **11** and dependent claims **12** and **13**, which contain all of the limitations of claim **11**, as being anticipated by Fukushima is improper and is requested to be removed.

Regarding independent claim **16**, Applicants have provisionally canceled claim **16** and associated dependent claims **20** and **23**. In light of canceling such claims, the rejection under U.S.C. §102(e) of claims **16**, **20** and **23** is rendered moot.



Discussion of the rejection of claims 4, 15, 8, 14, 21 and 22 under 35 U.S.C. §102(e)

As set forth above, claims **4, 15, 8, 14, 21** and **22** stand rejected under 35 U.S.C. §102(e) as being anticipated by (U.S. Patent 6, 226, 428) to Saito et al. Applicants traverse such a rejection.

The first element of amended independent claim **4** is as follows:

“at least one diffracting grating **operated in a Littrow configuration** which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number...”

Applicants thus submit that Saito et al. **does not disclose nor suggest** having “at least one diffraction grating operated in a Littrow configuration” as shown by the bolded limitation of the element above and thus does not disclose or teach every feature as mandated under as mandated under MPEP 706.02(a) and Azko as set forth above. The diffraction gratings as disclosed in Saito are comprised of a length of optical fiber with the index of the core permanently modified periodically usually when exposed to an ultraviolet interference pattern. As a result, the fiber grating behaves as a wavelength dependent reflector and lends itself to precise wavelength separation. See <http://www.fiber-optics.info/articles/dwdm.htm> for description of such devices. IN addition, Saito et al also describes such devices in the background (see lines 45-48, column 1) and corroborates using gratings having a periodic index modulation in the first paragraph of the summary of the invention (see column 2, lines 60-63). Such devices as disclosed in Saito et al. **cannot** be operated in a Littrow Configuration.

Conversely Applicants state as one example (see page 9, first full paragraph), “A prototype of an embodiment of the invention was experimentally demonstrated using a 400 lines/mm grating **operated in a Littrow configuration** with single-strand, multi-mode fiber inputs housed in an MT ferrule array connector.” To reiterate, Applicants submit that Saito cannot operate in such a configuration because it requires a diffraction grating having groove spacings and configured to diffract light back from which it came. The device as disclosed by Saito et al. however operates by a different physical phenomena.

Accordingly, Applicants respectfully submit that the rejection under U.S.C. §102(e) of amended independent claim 4 a is deemed improper and is requested to be removed.

Regarding dependent claims 15 and 22, such claims contain all of the limitations of the claim(s) from which they depend from (i.e., claim 4) and thus contain all of the limitations of claim 4. In light of the above arguments, the rejection of dependent claims 15 and 22 under U.S.C. §102(e) is also deemed improper and is requested to be removed.

Regarding dependent claims 8, 14, 21 (note: claim 21 has been canceled and its limitation are rewritten as new claim 26), such claims depend from independent claim 7. The first element of independent claim 7 is identical to the first element of independent claim 4 and is as follows:

“at least one diffracting grating **operated in a Littrow configuration** which utilizes only N wavelengths to interconnect N inputs to N outputs in a fully non-blocking manner, wherein N is any number...”

In light of the arguments regarding the rejection of claim 4 and dependent claims thereof, Applicants also respectfully submit that Saito et al. does not disclose nor suggest the limitations of amended independent claim 7. Therefore, Applicants submit that Saito et al. also does not suggest nor disclose all of the limitations of dependent claims **8, 14, 21** and new claim **26**, which directly or indirectly depend from claim 7 and thus contain all of the limitations of claim 7.

Accordingly, the rejection of claims **8, 14, 21** and new claim **26** under U.S.C. §102(e) is deemed improper and is requested to be removed.

### CONCLUSION

The undersigned respectfully submits that the rejections of the claims raised in the Office Action dated May 3, 2005 have been fully addressed and overcome, and the present application is believed to be in condition for allowance.

It is respectfully requested that this application be reconsidered and that remaining pending claims 1, 4, 6-15 and 22, 24-26 in this case be passed to issue. In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that can be clarified with a telephone conference, he is respectfully requested to initiate the same with the undersigned at (925) 422-3682.

Respectfully submitted,

Dated: \_\_\_\_\_

2/6/06



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Enclosures: 5 Replacement Sheets of Formal Drawings